Small Scale Processing of Locally Produced Edible Oils

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Introduction
Most edible vegetable oils used in the United States are processed in the Midwestern United States or in Western Canada. With a growing interest in locally produced foods, edible oil production has the potential to be decentralized with the seed grown and processed in a wide range of locales. In the Northeastern US, canola, sunflower, safflower, flax and other oilseed crops are able to be grown. Post-harvest processing of these oils on a small scale is not well understood and is the focus of a Northeast Sustainable Agriculture Research and Education (NESARE) grant. This project is shared between the Penn State College of Agricultural Sciences and University of Vermont Extension.

Edible oil processing steps
Vegetable oils sold on the grocery store shelf are “RBD” oils, meaning they have been:

R – Refined: filtering removes particulates and some gums
B – Bleached: removes colorants and other compounds that are blamed for rapid oxidation and reduced shelf life
D – Deodorized: removes odor and taste components

RBD processing results in a virtually tasteless, odorless, colorless edible oil. All oils will have similar characteristics regardless of the source or quality of the initial seed stock.

Minimally processed edible oils have characteristic flavor
Conventional oil processing removes the distinctive flavors of freshly pressed oils. Minimally processed canola oil has a nutty flavor, sunflower oil has the characteristic sunflower taste. These oils used fresh or for cooking impart that particular flavor to the food. Olive oil has been successfully marketed for a particular flavor; can locally grown oils be marketed using their characteristic flavor as an asset?

Refining
On a small scale, refining is handled by filtration. This is readily accomplished using a filter press and diatomaceous earth as the filter media.

Bleaching
Removing colorants: if necessary, bleaching clay in the presence of heat and absence of oxygen removes chlorophyll and other substances that increase oxidation in edible oils. Bleaching increases the useful life of the oil in deep fat frying applications.

Deodorizing
Deodorizing uses steam, vacuum and other processes and will likely not be used by small-scale processors.

Results
Accelerated Shelf Life Study of Filtered Canola Oil vs. RBD Oil

Lightly refined raw canola oil (filtered) only shows slower oxidation than commercially processed RBD canola oil. This indicator of longer shelf life is a positive selling point for a locally produced, minimally processed oil.

Sensory Evaluation
A creamy-style Italian dressing using filtered but unbleached canola oil compared favorably to a commercial, off-the-shelf similar product, showing no significant differences in 14 sensory categories. If formulated correctly and in harmony with naturally occurring flavors locally produced and minimally processed oils can be used successfully in food preparations.